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This index covers all items—papers, correspondence, reviews, etc.—that appeared in these publications during 1986, and items from prior years that were commented upon or corrected in 1986. The index is divided into an Author Index and a Subject Index, both arranged alphabetically.

The *Author Index* contains the primary entry for each item; this entry is listed under the name of the first author and includes coauthor names, title, location of the item, and notice of corrections and comments if any. Cross-references are given from each coauthor name to the name of the corresponding first author. The location of the item is specified by the journal name (abbreviated), year, month, and inclusive pages.

The *Subject Index* contains several entries for each item, each consisting of a subject heading, modifying phrase(s), first author's name—followed by + if the paper has coauthors—and enough information to locate the item. For coauthors, title, comments, and corrections if any, etc., it is necessary to refer to the primary entry in the Author Index. Subject cross-references are provided as required by the subject matter. Also provided whenever appropriate are listings under generic headings such as *Bibliographies* (for any paper with at least 50 references, as well as papers that are exclusively bibliographies), *Book reviews*, and *Special issues.*

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ac motor protection; cf. Synchronous motor protection
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  impulse strength of high voltage motor insulation. *Gupta, B.K., + , T-EC Dec 86* 130–134

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  - large ac motor winding-insulation breakdown due to steep switching surges; calculation of surge magnitude for risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 130–139.
  - large ac motor winding-insulation breakdown due to steep switching surges; probabilistic risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 140–151.
  - transient voltage propagation in winding of large ac motor; results of impulse tests. *Gupta, B.K., + , T-EC Mar 86* 122–129. †
  - ventilation simulation for hydroturbine generator – motor. *Fukushima, M., + , T-EC Sep 86* 174–181
- **ac motors; cf.** Induction motors; Permanent magnet motors; Universal motors
- **Accelerated testing**
  - nuclear power plant class 1E electrical/electronic components in mild environmental areas of plant; accelerated aging and seismic testing. *Jabs, R.H., + , T-EC Jun 86* 27–29
- **Accidents; cf.** Protection/safety
- **Adaptive control**
  - reactive power control for distribution feeders; computer-controlled adaptive compensator. *Keene, G., + , T-PWRD Jul 86* 337–345
- **Adaptive control, linear systems**
  - power generation control; digital multivariable optimal control system. *Ohtsuka, K., + , T-EC Jun 86* 88–98.
  - stochastic-environment adaptive excitation control for synchronous generators. *Romero, D.R., + , T-PWRS Feb 86* 168–175
- **Adaptive control, nonlinear systems**
  - adaptive synchronous machine stabilizer using least-squares identification with varying forgetting factor and self-searching control strategy. *Cheng, S.-, + , T-PWRS Aug 86* 101–109.
- **Adaptive filters**
  - distribution-line communication system harmonic noise reduction using hard limiter and adaptive noise canceller. *Trussell, H.J., + , T-PWRD Jan 86* 73–78
- **Adaptive systems**
  - power system alarm and message processing; adaptive methods. *Amelink, H., + , T-PWRS Aug 86* 188–194
- **Aerodynamics; cf.** Power transmission mechanical factors
- **Air-blast circuit breakers**
  - dielectric recovery of airblast monoflow model interrupter with insulating nozzle. *Campbell, L.C., + , T-PWRD Jul 86* 127–133
  - interrupting tests on 275-kV reactor currents for SF_6 and air circuit breakers. *Kobayashi, A., + , T-PWRD Apr 86* 87–94.
- **Air break switches**
  - current interrupting capability of air-break disconnect switches. *Peelo, D.F., T-PWRD Jan 86* 212–216
- **Air conditioning; cf.** Load management
- **Air gaps**
  - minimizing potential gradient at most stressed points by modifying gap geometry and adding conductive barriers. *Shirmohammadi, D., + , T-PWRD Apr 86* 169–181.
- **Air pollution; cf.** Thermal power generation, air pollution
- **Alarm systems; cf.** Power system monitoring
- **Aluminum conductors**
  - natural aging of nonenergized aluminum conductors; time required for new conductor to have same characteristics as aged conductor. *Booker, J.R., T-PWRD Oct 86* 269–274.
- **Aluminum conductors, power**
  - ac resistance model for ACSR. *Barrett, J.S., + , T-PWRD Apr 86* 198–208.
  - radial and axial temperature gradients in bare stranded conductor. *Douglass, D.A., T-PWRD Apr 86* 7–15.
- **AM broadcast transmitters**
  - antenna pattern distortion due to nearby power transmission lines, towers, and skywires. *Madge, R.C., + , T-PWRD Apr 86* 163–168.
- **Angular velocity control; cf.** Power generation control, governor
- **Antenna proximity factors**
  - AM broadcast radiation pattern distortion due to nearby power transmission lines, towers, and skywires. *Madge, R.C., + , T-PWRD Apr 86* 163–168.
- **Antennas; cf.** Buried antennas
- **Approximation methods; cf.** Describing functions
- **Arc discharges**
  - RF-interference-induced arcing of turbogenerator stator windings. *Emery, F.T., + , T-EC Jun 86* 172–179.
- **Arc heating**
  - VAR compensator for arc furnaces consisting of PWM inverter in parallel with load. *Cox, M.D., + , T-PWRS Aug 86* 110–120.
- **Arctic regions**
  - power transformers and shunt reactors for arctic regions; performance and operation guidelines. *Lampe, W., T-PWRD Jan 86* 217–224
  - 69-kV high-pressure gas-filled pipe-type cable system for arctic environment. *Silver D. A., + , T-PWRD Jan 86* 41–50.
- **Array processing**
  - sparse network equations; fast solution method using array processor. *Taoka, H., + , T-PWRS Nov 86* 215–221
- **Artificial intelligence; cf.** Expert systems
- **Askarel insulation; cf.** Polychlorinated biphenyls
- **Asynchronous rotating machines; cf.** Induction machines
- **Atmosphere; cf.** Power system meteorological factors

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- **Bar code reading**
  - visual inspection programs; computer based barcoded visual inspection program for ASME section XI class 1, 2, & 3 supports. *Wright, W.M., T-EC Dec 86* 9–11
- **Batteries**
  - battery energy storage for load-frequency control and instantaneous reserve. *Künisch, H.-J., + , T-EC Sep 86* 41–46
  - Battery Energy Storage Test Facility data on various aspects of utility-sited and -operated systems. *Pivec, A., + , T-EC Sep 86* 47–54
  - testing of large lead stationary batteries in generating plants. *Anderson, J. W., T-EC Sep 86* 76–79.
  - utility load leveling; types of batteries and balance-of-plant considerations. *Abraham, J., + , T-EC Jun 86* 131–136
- **Batteries; cf.** Power generation auxiliary systems
- **Bearings (direction-finding); cf.** Direction-finding
- **Biological gases**
  - integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24
- **Biological thermal factors**
  - heat stress effects on power plant workers; sources and management. *Waner, N.S., T-EC Jun 86* 36–41
- **Bismuth materials/devices; cf.** Magnetooptic materials/devices
- **Boilers; cf.** Steam generation
- **Britain; cf.** United Kingdom
- **Brushless rotating machines**
  - high-initial-response brushless excitation system for mine mouth power plant connected to extremely long EHV transmission system. *Stigers, C.A., + , T-EC Mar 86* 2–10.
- **Buildings**
  - fire involving PCB-filled transformer in underground vault adjacent to high-rise office building; decontamination of building. *Maslowski, R., + , T-PWRD Jan 86* 239–244
- **Bundle conductors**
  - probabilistic short-circuit uprating of station strain bus system; evaluation of insulator assembly failures due to conductor bundle collapse or conductor swingout. *Vainberg, M., + , T-PWRD Oct 86* 129–136
  - probabilistic short-circuit uprating of station strain bus system; reliability and operating considerations. *Ramani, N., + , T-PWRD Oct 86* 137–141
- **Buried antennas**
  - low-frequency fields generated by overhead and buried short conductors; single conductor. *Dawalibi, F., T-PWRD Oct 86* 105–111.
  - low-frequency fields generated by overhead and buried short conductors; ground networks. *Dawalibi, F., T-PWRD Oct 86* 112–119.
- **Business economics**
  - electric power interruption cost to utility's commercial customers having standby systems; customer damage function. *Billinton, R., + , T-PWRS Nov 86* 28–33
- **Business planning**
  - quick spreadsheet corporate models for strategic planning. *Merrill, H.M., + , T-PWRS Aug 86* 244–250

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- **Cables; cf.** Power cables
- **CAE; cf.** Computer-aided engineering
- **Calibration**
  - calibration of test systems for measuring power losses of transformers. *Mehta, S.P., + , T-PWRD Oct 86* 215–223.
  - power system remote measurement calibration. *Adibi, M.M., + , T-PWRS May 86* 194–203.
- **Canada**
  - power distribution system reliability evaluation methods; survey of utilities. *Kostyal, S., + , T-PWRD Apr 86* 114–120.
- **Capacitive energy storage**
  - testing HVDC circuit breakers; capacitive energy storage circuit for synthetic testing. *Voshall, R.E., + , T-PWRD Jan 86* 185–190
- **Capacitor-compensated transmission lines**
  - distribution system line loss reduction through enhanced capacitor location techniques. *Bishop, M.T., + , T-PWRD Apr 86* 190–197.
  - EHV series-capacitor reinsertion; SiC and ZnO varistors compared. *Achilles, R.A., + , T-PWRS Aug 86* 127–134.
  - reactive power planning of subtransmission network under normal operation; optimization method. *Lee, K.Y., + , T-PWRS May 86* 153–159

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- series-capacitor compensation of long lines evaluated from technical and economic standpoints. *Saied, M.M., T-PWRD Apr 86* 248–253.

Capacitor-compensated transmission lines; cf. Subsynchronous resonance

Capacitor switching
- EHV series-capacitor reinsertion; SiC and ZnO varistors compared. *Achilles, R.A., + , T-PWRS Aug 86* 127–134.
- excessive current surges in varistors and fuses protecting thyristor motor drives at remote substation, due to switching of capacitors. *Martzloff, F.D., T-PWRD Apr 86* 59–66.
- phase-to-phase surges at substations other than where bank is being switched. *Jones, R.A., + , T-PWRD Jul 86* 240–244.
- switching concerns associated with 345-kV shunt capacitor applications; results of New York Power Authority study. *Mikhail, S.S., + , T-PWRD Apr 86* 221–230.
- synthetic test circuit for circuit breakers; reignition circuit using triggered vacuum gaps in series as fast switches. *Vries, L.M.J., + , T-PWRD Apr 86* 75–80.

Capacitors; cf. Power capacitors

Cathode-ray tube displays
- computer-based distribution automation with geographical display of distribution network. *Kato, S., + , T-PWRD Jan 86* 265–271

China
- high-voltage engineering education in People's Republic of China. *Yan, Z., T-PWRS Nov 86* 196–201.

Circuit-breaker testing
- digital acquisition and numerical processing of measuring signals at high-voltage circuit breaker testing laboratory. *Hanriot, J.M., + , T-PWRD Jul 86* 134–139
- gas-blast circuit breaker interrupting tests on 275-kV reactor currents for SF_6 and air circuit breakers. *Kobayashi, A., + , T-PWRD Apr 86* 87–94.
- HVDC circuit breakers; capacitive energy storage circuit for synthetic testing. *Voshall, R.E., + , T-PWRD Jan 86* 185–190
- low-cost SF_6 arcing byproduct detectors for field use in gas-insulated switchgear. *Braun, J.M., + , T-PWRD Apr 86* 81–86.
- switching of disconnectors in gas-insulated switchgear with voltage transformer in circuit; preventing overvoltages. *Lalot, J., + , T-PWRD Jan 86* 203–211
- synthetic test circuit for circuit breakers; reignition circuit using triggered vacuum gaps in series as fast switches. *Vries, L.M.J., + , T-PWRD Apr 86* 75–80.
- synthetic testing method for generator circuit breakers. *Thuries, E., + , T-PWRD Jan 86* 179–184
- 2-MV 4.5-MJ synthetic test source for HV circuit breakers. *St-Jean, G., T-PWRD Jan 86* 191–195

Circuit breakers
- nuclear power plant reactor trip breakers; performance improvement after Feb. 1983 incident at Salem plant. *Stevens, H.H., + , T-EC Jun 86* 5–10
- nuclear power plant reactor trip switchgear undervoltage trip failures; US NRC overview. *Wright, R.J., + , T-EC Jun 86* 11–15

Circuit breakers; cf. Air-blast circuit breakers; EHV circuit breakers; Gas-blast circuit breakers; HVDC circuit breakers; SF_6 circuit breakers

Circuit synthesis
- equivalent networks for analysis of power system transients. *Do, V.Q., + , T-PWRD Apr 86* 103–113.

Circuit topology
- interlocking of substations; topology-based approach suited for microprocessors. *Brand, K.P., + , T-PWRD Jul 86* 118–126

Circuit topology; cf. Graph theory

Circuits; cf. Equivalent circuits; Lossless circuits; Phase shifters

Climate; cf. Power system meteorological factors

Coal
- combustion diagnosis method for pulverized coal boilers using flame-image recognition technology. *Kurihara, N., + , T-EC Jun 86* 99–103
- multivariable control of coal mill for steam turbine-driven generator; control strategy and field test results. *Bollinger, K.E., + , T-PWRS Feb 86* 96–100

Coal industry; cf. Mining industry

Cogeneration
- real-time wheeling losses; computation techniques for energy management systems. *Ramanathan, R., T-PWRS Aug 86* 314–320

Coils; cf. Inductors; Power transformers; Rotating machines

Communication systems; cf. Power distribution communication; Power system communication

Computer-aided engineering
- computer-aided engineering using relational database for transmission system protection. *Damborg, M.J., + , T-PWRS May 86* 187–193
- computer languages for power engineering; Ada and Fortran. *Jampala, A.K., + , T-PWRS Feb 86* 185–192.

Computer applications; cf. *Specific topic*

Computer graphics; cf. Engineering drawings

Computer interfaces
- data extraction from computer-aided drafting system in form for input to wiring program. *Lindsay, R.P., + , T-EC Jun 86* 82–87

Computer languages
- computer languages for power engineering; Ada and Fortran. *Jampala, A.K., + , T-PWRS Feb 86* 185–192.

Computer languages; cf. Microcomputer languages

Computer networks; cf. Local area networks

Computers; cf. Distributed computing; Parallel processing

Conductors
- forces on conductor segments and magnetized ferrous cores using 3-D finite-element vector-potential method. *Demerdash, N.A., + , T-EC Sep 86* 109–117

Conductors; cf. Aluminum conductors; Bundle conductors; Power transmission lines

Control systems; cf. Describing functions; Digital control; Multivariable systems; Power generation control; Power system control; Programmable control; Proportional control

Cooling; cf. Thermal factors; Ventilation

Corona
- corona modeling for calculation of transients on transmission lines. *Semlyen, A., + , T-PWRD Jul 86* 228–239.
- partial discharge and noise-pulse propagation in turbogenerator stator winding insulation; application to maintenance testing. *Henriksen, M., + , T-EC Sep 86* 161–166.

Corona; cf. Power transmission electromagnetic interference

Costs; cf. Business economics; Economics; Power system economics

Cross-linked polyethylene insulation; cf. Polyethylene-insulated cables, cross-linked

Current comparators
- high-voltage power measurements at very low power factors using current comparator. *So, E., T-PWRD Jan 86* 98–104

Current measurement
- ground-fault current distribution and substation ground impedance measurement at LG-2 complex in Quebec. *Fortin, J., + , T-PWRD Jul 86* 48–60.
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

Current transformers
- high-speed current differential protection scheme using fiber-optic link for 3-terminal transmission lines. *Aggarwal, R.K., + , T-PWRD Jan 86* 125–134.

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Data acquisition; cf. Measurement-system data handling

Data communication; cf. Local area networks; Measurement-system data handling; Power system communication

Data structures
- proposed data structure for exchange of power system analytical data. *IEEE Power Engineering Society, Power System Engineering Ctte., Working Group on Exchange of Power System Analytical Data, T-PWRS May 86* 8–16.

Database systems; cf. Information systems

Database systems, relational
- computer-aided engineering using relational database for transmission system protection. *Damborg, M.J., + , T-PWRS May 86* 187–193

dc circuit breakers; cf. HVDC circuit breakers

dc motors
- dc motors powered by photovoltaic power; starting and steady-state characteristics for constant load and ventilator load. *Appelbaum, J., T-EC Mar 86* 17–25.

dc motors; cf. Universal motors

dc power transmission; cf. HVDC transmission

Decision-making
- determining level-of-protection for small power producer/utility interconnection; decision analysis model. *Bowe, T.R., + , T-PWRD Jul 86* 78–89.

Decoupling of systems, linear
- power system static security analysis; real-time decoupled equivalent models. *Prasad, G.D., + , T-PWRS Aug 86* 18–24
- rotating-machine decoupled reduced-order linear state-space model; application to synchronous machines. *Diao, Y.-, + , T-EC Sep 86* 211–216

Decoupling of systems, nonlinear
- decoupled optimal load flow using linear or quadratic programming. *Contaxis, G.C., + , T-PWRS May 86* 1–7
- double-cage induction motor simulation including stator transients; decomposed reduced-order model. *Richards, G.G., + , T-EC Sep 86* 87–93

Delay effects
- time-delay compensation for high-speed digital protection of power systems. *Kumar, B.S.A., T-PWRD Oct 86* 68–73.

Describing functions
- power transmission line conductor galloping; maximum amplitude estimation using describing function analysis. *Egbert, R.I., T-PWRD Jan 86* 251–257.

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Desert regions
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Developing nations
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DFT; cf. Discrete Fourier transforms
Dielectric breakdown; cf. Insulation
Dielectric losses
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Differential transformers
dc bias effect on sensitive ground-fault interrupter performance. *Emanuel, A.E., + , T-PWRD Jan 86* 111–117
Digital communication; cf. Pseudonoise-coded communication
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triplicated digital control equipment with high reliability and performance. *Ishikawa, M., + , T-PWRD Apr 86* 254–263.
Digital filters
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Digital filters; cf. FIR digital filters
Direction-finding
lightning detection network along US east coast and to Ohio; network of magnetic direction-finders. *Orville, R.E., + , T-PWRS Nov 86* 243–246
Disconnecting switches
current interrupting capability of air-break disconnect switches. *Peelo, D.F., T-PWRD Jan 86* 212–216
restriking transient overvoltage on disconnecting switch for gas switchgear; estimation by calculation. *Ogawa, S., + , T-PWRD Apr 86* 95–102.
switching of disconnectors in gas-insulated switchgear with voltage transformer in circuit; preventing overvoltages. *Lalot, J., + , T-PWRD Jan 86* 203–211
Discrete Fourier transforms
power generation system reliability indices calculation using FFT. *Mohan, P., + , T-PWRS Aug 86* 88–94
Discrete-time filters; cf. FIR digital filters
Dispatching; cf. Power generation dispatch
Dispersed storage and generation
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overvoltages on isolated feeders connected to synchronous or induction generators due to ferroresonance. *Feero, W.E., + , T-PWRD Jan 86* 258–264
short-run value of nonutility-generated electricity. *Jabbour, S.J., T-EC Mar 86* 11–16.
Dispersed storage and generation; cf. Batteries; Photovoltaic power; Wind power generation
Displays; cf. Cathode-ray tube displays
Distributed computing
power system fault diagnosis and protection. *Talukdar, S.N., + , T-PWRS Aug 86* 182–187
Distributed control
power system distributed local control system integrated in existing telecontrol network. *Ventosa, J., + , T-PWRD Oct 86* 159–165
Distributed-parameter circuits
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Domestic appliances; cf. Home appliances
Dynamic programming
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Dynamic stability; cf. Power system stability, dynamic

E

Earthquakes; cf. Seismic factors
Economic dispatch; cf. Power generation dispatch
Economics; cf. Business economics; Motor economics; Power generation economics; Power system economics
Eddy currents
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3-D electromagnetic analysis of electrical machinery and devices; theory. *Chari, M.V.K., + , T-EC Jun 86* 145–150
3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157
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EHV cables; cf. EHV transmission lines
EHV circuit breakers
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EHV measurements
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EHV substations
EHV gas-insulated substation in area of seismic activity; engineering design and construction. *Sabath, J., + , T-PWRD Oct 86* 152–158
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EHV transformers
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EHV system planning including reliability and operational security considerations; Monte Carlo method. *Dodu, J.C., + , T-PWRS Aug 86* 175–181
EHV system protection using digital directional comparison relays. *Johns, A.T., + , T-PWRD Apr 86* 24–34.
ground-potential distribution in neighborhood of Itaipu hydroelectric plant during transmission system ground faults; subarea resistivities included. *Sobral, S.T., + , T-PWRD Jan 86* 85–90
high-initial-response brushless excitation system for mine mouth power plant connected to extremely long EHV transmission system. *Stigers, C.A., + , T-EC Mar 86* 2–10.
multi-microprocessor traveling-wave relay for EHV/UHV transmission protection. *Mansour, M.M., + , T-PWRD Jan 86* 272–279
qualification of switchable metal-oxide arresters for protective level of 1.6 p.u. on Hydro-Quebec's 735-kV system. *Latour, Y., + , T-PWRD Oct 86* 184–193.
real-time optimal voltage/VAR control of Ontario Hydro EHV system to reduce active transmission losses. *El-Kady, M.A., + , T-PWRS May 86* 98–107.
switching concerns associated with 345-kV shunt capacitor applications; results of New York Power Authority study. *Mikhail, S.S., + , T-PWRD Apr 86* 221–230.
EHV transmission lines
minimum safety distance calculation using statistical method for live-line maintenance; application to 765-kV line. *Esmeraldo, P.C.V., + , T-PWRD Apr 86* 264–271.
ZnO sheath voltage limiter for HV and EHV power cable; field experience and laboratory tests. *Parmigiani, B., + , T-PWRD Jan 86* 164–170
900-MHz EMI measurements on 230-kV and 500-kV power lines. *Chartier, V.L., + , T-PWRD Apr 86* 140–149.
Eigenvalues/eigenvectors
integrated ac/dc system dynamic performance improvement using optimal modulation control; evaluation using eigenvalue sensitivity analysis. *Choudhry, M.A., + , T-PWRS May 86* 128–137.
power system small-signal stability analysis using eigenvalue and frequency response methods. *Martins, N., T-PWRS Feb 86* 217–226.
power system stabilizer at multiunit pumped-storage plant; eigenvalue analysis. *Czuba, J.S., + , T-PWRS Feb 86* 121–128.
wave propagation in polyphase transmission lines; general solution that includes cases where ordinary modal theory fails. *Brandão Faria, J.A., + , T-PWRD Apr 86* 182–189.
Electric shock
dc bias effect on sensitive ground-fault interrupter performance. *Emanuel, A.E., + , T-PWRD Jan 86* 111–117
human safety near HVDC ground electrode; probabilistic evaluation. *Wang, W., + , T-PWRD Jan 86* 105–110

- minimum safety distance calculation using statistical method for live-line maintenance; application to 765-kV line. *Esmeraldo, P.C.V., + , T-PWRD Apr 86* 264–271.
- safety against lightning for linemen working on de-energized power lines. *Mousa, A.M., + , T-PWRD Jan 86* 245–250
- step-and-touch potentials near transmission structures; background information. *IEEE Power Engineering Society, Transmission and Distribution Ctte., Working Group on Transmission Line Structure Grounding, Towers, Poles and Conductors, + , T-PWRD Apr 86* 150–157.
- step-and-touch potentials near transmission structures; engineering evaluation. *IEEE Power Engineering Society, Transmission and Distribution Ctte., Working Group on Transmission Line Structure Grounding, Towers, Poles and Conductors, + , T-PWRD Apr 86* 158–162

Electric utilities; cf. Power industry

Electric variables measurement; cf. Current measurement; Power measurement; Power system measurements; Voltage measurement

Electrical engineering education; cf. Power engineering education

Electrodes; cf. Grounding electrodes

Electromagnetic analysis
- 3-D electromagnetic analysis of electrical machinery and devices; theory. *Chari, M.V.K., + , T-EC Jun 86* 145–150
- 3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157

Electromagnetic forces; cf. Magnetic forces

Electromagnetic induction
- common-corridor sharing by overhead power line, railroad, and pipeline; induced voltages and currents. *Frazier, M., + , T-PWRD Jul 86* 294–300
- distribution of induced ground current in large-capacity gas-insulated substation using multipoint grounding system. *Yoshida, T., + , T-PWRD Oct 86* 120–128.
- natural-gas pipeline in vicinity of HV substations and transmission structures; induction and earth-conduction effects due to phase-to-ground faults. *Dawalibi, F., + , T-PWRD Apr 86* 40–48.

Electromagnetic induction; cf. Eddy currents

Electromagnetic interference, radiated
- RF-interference-induced arcing of turbogenerator stator windings. *Emery, F.T., + , T-EC Jun 86* 172–179.

Electromagnetic interference, radiated; cf. Power transmission electromagnetic interference

Electromagnetic measurements; cf. Magnetic measurements; UHF measurements

Electromagnetic pulse; cf. EMP radiation effects

Electromagnetic radiation
- low-frequency fields generated by overhead and buried short conductors; single conductor. *Dawalibi, F., T-PWRD Oct 86* 105–111.
- low-frequency fields generated by overhead and buried short conductors; ground networks. *Dawalibi, F., T-PWRD Oct 86* 112–119.

Electromagnetic radiation effects; cf. Electromagnetic induction; Electromagnetic interference, radiated; EMP radiation effects

Electromagnetic transient analysis; cf. Power system transients

Electromagnets; cf. Superconducting magnets

Electromagnets, pulsed
- electromagnetic pulse power coils for repositioning coolant tube spacers in CANDU nuclear reactors. *Dableh, J.H., + , T-EC Dec 86* 1–8

Electrooptic transducers
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

ELF radiation effects; cf. Power transmission electromagnetic interference

Emergency/standby power systems
- cost of utility service interruption to utility's commercial customers having standby systems; customer damage function. *Billinton, R., + , T-PWRS Nov 86* 28–33
- local generating facilities in reliability evaluation of distribution systems; model and algorithm. *Dialynas, E.N., + , T-PWRS Nov 86* 62–67

EMI; cf. Electromagnetic interference

EMP radiation effects
- MHD-EMP effects of power systems; assessment method. *Legro, J.R., + , T-PWRD Jul 86* 203–210

Employment; cf. Engineering profession

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Energy management; cf. Load management; Power system control

Energy resources; cf. Fuels; Geothermal energy; Wind energy

Energy storage; cf. Batteries; Dispersed storage and generation; Power generation peaking capacity; Superconducting magnets, energy storage; Thermal energy storage

Engineering drawings
- data extraction from computer-aided drafting system in form for input to wiring program. *Lindsay, R.P., + , T-EC Jun 86* 82–87

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Engineering profession
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Environmental factors; cf. Polychlorinated biphenyls

Equivalent circuits
- equivalent networks for analysis of power system transients. *Do, V.Q., + , T-PWRD Apr 86* 103–113.

Estimation; cf. Power system parameter estimation; Power system state estimation

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Excitation control; cf. Power generation control, excitation

Excitation systems; cf. Power generation excitation systems

Expert systems
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- intelligent load flow engine for power system planning. *Fujiwara, R., + , T-PWRS Aug 86* 302–307
- online diagnosis of turbogenerator using expert system. *Gonzalez, A.J., + , T-EC Jun 86* 68–74
- power system alarm and message processing; adaptive methods. *Amelink, H., + , T-PWRS Aug 86* 188–194
- power system fault diagnosis and protection. *Talukdar, S.N., + , T-PWRS Aug 86* 182–187
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Failure analysis
- asymptotics of moments of order statistics and failure occurrence sequences. *Kogan, V.I., T-EC Mar 86* 61–67

Failure analysis; cf. Life estimation; Power system reliability

Faraday effect
- gas-insulated cable fault section detection using Faraday-effect optical magnetic field sensor. *Nakamura, E., + , T-PWRD Jan 86* 19–26
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

Fault diagnosis; cf. Power system faults

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- dispersed storage and generation; overvoltages on isolated feeders connected to synchronous or induction generators due to ferroresonance. *Feero, W.E., + , T-PWRD Jan 86* 258–264

FFT (fast Fourier transform); cf. Discrete Fourier transforms

Fiber optics; cf. Optical fibers

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- computerization of large relay-setting file. *Zimering, R., + , T-PWRD Jan 86* 135–142.

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Filters; cf. Adaptive filters; Digital filters

Finance; cf. Economics

Finite-duration impulse-response digital filters; cf. FIR digital filters

Finite-element methods
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- forces on conductor segments and magnetized ferrous cores using 3-D finite-element vector-potential method. *Demerdash, N.A., + , T-EC Sep 86* 109–117
- large ac motor winding-insulation breakdown due to steep switching surges; calculation of surge magnitude for risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 130–139.
- large ac motor winding-insulation breakdown due to steep switching surges; probabilistic risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 140–151.
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- superconducting generator at 300-MVA; thermal stress analysis and stator design using finite elements. *Nathenson, R.D., + , T-EC Sep 86* 141–147
- 3-D electromagnetic analysis of electrical machinery and devices; theory. *Chari, M.V.K., + , T-EC Jun 86* 145–150
- 3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157

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Fourier transforms; cf. Discrete Fourier transforms

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- energy control computer system of French national power system; present state and planned developments. *Carpentier, J., T-PWRS Nov 86* 42–48

Frequency control; cf. Power system stability

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- fuel resource scheduling for generating units; long-term problem. *Kumar, A.B.R., + , T-PWRS Nov 86* 145–151
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Fuels; cf. Natural gas; Waste materials

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Garbage; cf. Waste materials

Gas-blast circuit breakers
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- switching of disconnectors in gas-insulated switchgear with voltage transformer in circuit; preventing overvoltages. *Lalot, J., + , T-PWRD Jan 86* 203–211

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Gas discharges; cf. Arc discharges; Corona; Flashover; SF_6 insulation

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Gas-insulated cables
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- heat transfer characteristics of gas-insulated cables under constant and varying temperature. *Minaguchi, D., + , T-PWRD Jan 86* 2–9

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- suppression of fast transient overvoltage during gas disconnector switching in gas-insulated substation. *Ozawa, J., + , T-PWRD Oct 86* 194–201.

Gas insulation; cf. SF_6 insulation

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- distribution of induced ground current in large-capacity gas-insulated substation using multipoint grounding system. *Yoshida, T., + , T-PWRD Oct 86* 120–128.
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Grounding; cf. Electric shock

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- terminating at low short-circuit-ratio locations; report on panel discussion on five dc projects held at Feb. 1985 Winter Power Meeting. *IEEE Power Engineering Society, Transmission & Distribution Ctte., Working Group on Interaction with Low Short Circuit Radio ac Systems, + , T-PWRD Jul 86* 308–318
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Induction motors; cf. Linear induction motors

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Interference; cf. Electromagnetic interference, radiated; Noise; Power transmission electromagnetic interference

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dc bias effect on sensitive ground-fault interrupter performance. *Emanuel, A.E., + , T-PWRD Jan 86* 111–117

Interrupters; cf. Circuit breakers; Vacuum interrupters

Invariant imbedding

nonlinear power system transient-state estimation using invariant imbedding. *Gharban, C.K., + , T-PWRS Aug 86* 276–283

Inverters; cf. Power conversion, dc – ac; Pulse-width modulation, inverters

Italy

power generation and transmission control system of ENEL (Italian State Power Board). *Galli, F., + , T-PWRS Aug 86* 10–17

J

Japan

modeling geothermal field near Tokyo. *Ito, F., + , T-EC Jun 86* 120–124

K

Knowledge-based systems; cf. Expert systems

L

Languages; cf. Computer languages

Laplace transforms

asymptotics of moments of order statistics and failure occurrence sequences. *Kogan, V.I., T-EC Mar 86* 61–67

***LC* circuits; cf.** Lossless circuits

Least-squares estimation

adaptive synchronous machine stabilizer using least-squares identification with varying forgetting factor and self-searching control strategy. *Cheng, S.-, + , T-PWRS Aug 86* 101–109.

Life estimation
- aging of electrical appliances due to power system harmonics; transformers, universal motors, and induction motors. *Fuchs, E.F., + , T-PWRD Jul 86* 301–307
- gapless ZnO surge arrester life estimation. *Carlson, W.G., + , T-PWRD Apr 86* 67–74.
- probabilistic models of life distributions. *Kogan, V.I., T-EC Mar 86* 54–60
- stochastically periodic harmonics in power systems; estimating additional losses and loss-of-life in system. *Emanuel, A.E., + , T-PWRD Jul 86* 285–293
- ZnO surge arresters; ac voltage aging of ZnO ceramics in air, SF_6, and transformer oil. *Vicaud, A., T-PWRD Apr 86* 49–58.

Life estimation; cf. Accelerated testing

Lightning
- lightning detection network along US east coast and to Ohio; network of magnetic direction-finders. *Orville, R.E., + , T-PWRS Nov 86* 243–246

Lightning, power systems
- burn-down failure of overhead covered conductor at insulator tie due to lightning surges. *Nakamura, K., + , T-PWRD Oct 86* 250–258.
- distribution surge arrester behavior due to lightning-induced voltages. *Yokoyama, S., T-PWRD Jan 86* 171–178
- induced voltage on overhead line; extension of Chowdhuri – Gross model. *Liew, A.C., + , T-PWRD Apr 86* 240–247.
- induced voltages on distribution lines; current and voltage waveform measurements. *Yokoyama, S., + , T-PWRD Apr 86* 129–139.
- safety against lightning for linemen working on de-energized power lines. *Mousa, A.M., + , T-PWRD Jan 86* 245–250
- ZnO surge arrester performance, remote monitoring; special surge analyzer. *Nichols, D.K., + , T-PWRD Jul 86* 191–196

Limit cycles
- power transmission line conductor galloping; maximum amplitude estimation using describing function analysis. *Egbert, R.I., T-PWRD Jan 86* 251–257.

Limiting
- distribution-line communication system harmonic noise reduction using hard limiter and adaptive noise canceller. *Trussell, H.J., + , T-PWRD Jan 86* 73–78

Linear induction motors
- balanced voltage operation; two models compared. *Bolopion, A., + , T-EC Sep 86* 118–121
- imbalance characteristics of full and part winding excited double-sided linear induction machine. *Yegna Narayanan, S.S., + , T-EC Dec 86* 142–148

Linear motors; cf. Linear induction motors; Linear synchronous motors

Linear programming
- decoupled optimal load flow using linear or quadratic programming. *Contaxis, G.C., + , T-PWRS May 86* 1–7
- integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24
- investment planning for hydrothermal power system expansion; stochastic programming using Dantzig – Wolfe decomposition principle. *Sanghvi, A.P., + , T-PWRS May 86* 115–121
- power system network topology optimization with security constraints. *Bacher, R., + , T-PWRS Nov 86* 103–111
- power system state estimation using decoupled linear programming method. *Lo, K.L., + , T-PWRS Feb 86* 154–160
- reactive power dispatch based on sparse sensitivity matrix and linear programming. *Mota-Palomino, R., + , T-PWRS Aug 86* 31–39

Linear programming; cf. Integer programming

Linear synchronous motors
- operating characteristics. *Lorenzen, H.W., + , T-EC Dec 86* 73–82

Linear systems; cf. Adaptive control, linear systems; Decoupling of systems, linear; Observability, linear systems; Optimal control, linear systems; Parameter identification, linear systems; Proportional control, linear systems; Reduced-order systems, linear; Sensitivity analysis/optimization, linear systems

Linear systems, stochastic
- stochastic-environment adaptive excitation control for synchronous generators. *Romero, D.R., + , T-PWRS Feb 86* 168–175

Liquid dielectric materials/devices; cf. Oil insulation; Polychlorinated biphenyls

Load dispatching; cf. Power generation dispatch

Load flow analysis
- ac voltage stability at HVDC terminals; computation algorithm. *Hammad, A.E., + , T-PWRS Feb 86* 209–216.
- decoupled optimal load flow using linear or quadratic programming. *Contaxis, G.C., + , T-PWRS May 86* 1–7
- dynamic load flow technique for power system simulators. *Ramanathan, R., + , T-PWRS Aug 86* 25–30
- hydrothermal optimal load flow formulation and solution using Newton's method. *El-Hawary, M.E., + , T-PWRS Aug 86* 157–167.
- intelligent load flow engine for power system planning. *Fujiwara, R., + , T-PWRS Aug 86* 302–307
- load response to voltage variations and effect on dynamic stability; application to Hydro-Quebec power system. *Langevin, M., + , T-PWRS Nov 86* 112–118
- maximal steady-state security regions computation based on dc load flow model. *Liu, C.-C., T-PWRS Nov 86* 19–27.
- multiterminal HVDC load-flow with flexible control specifications. *Mahseredjian, J., + , T-PWRD Apr 86* 272–282.
- proposed data structure for exchange of power system analytical data. *IEEE Power Engineering Society, Power System Engineering Ctte., Working Group on Exchange of Power System Analytical Data, T-PWRS May 86* 8–16.
- real-time optimal voltage/VAR control of Ontario Hydro EHV system to reduce active transmission losses. *El-Kady, M.A., + , T-PWRS May 86* 98–107.

Load flow control
- corrective control of power system flows by line and bus-bar switching. *Mazi, A.A., + , T-PWRS Aug 86* 258–265.

Load forecasting; cf. Power system planning

Load frequency control; cf. Power generation control, load frequency

Load leveling; cf. Power generation peaking capacity

Load management
- air-conditioner cycling at San Diego Gas and Electric; capacity-equivalence-factor determination. *Gilleskie, R.J., + , T-PWRS Aug 86* 67–73
- direct-load-control dispatch for fuel cost minimization; formulation and algorithm. *Bhatnagar, R., + , T-PWRS Nov 86* 96–102
- evaluation as electric system resource. *Geier, D.L., + , T-PWRS Aug 86* 40–45
- five years' experience with direct-control load management from operations viewpoint. *Becker, D.L., T-PWRS Feb 86* 82–88
- group load curtailment using integrated communications/load control network. *Rostoni, J.W., + , T-PWRS Nov 86* 233–237
- integrating demand-side management into utility planning. *IEEE Power Engineering Society, Power System Engineering Ctte., Demand-Side Management Sctte., + , T-PWRS Aug 86* 81–87
- integrating load management into energy management system's normal operations. *Chan, M.L., + , T-PWRS Nov 86* 152–157
- integrating load management into supply-side operations; hardware/firmware considerations. *Shekel, J., T-PWRS Nov 86* 132–136
- marketing customer thermal energy storage to reduce peak demand. *Bentley, W.G., + , T-PWRS Nov 86* 57–61
- pricing as marketing tool in Europe. *Edvinsson, M.J., T-PWRS Nov 86* 83–89
- Sweden's nation-wide load management program. *Bohlin, P., + , T-PWRS Nov 86* 90–95
- voltage reduction impact on energy use and demand level; results of 18-month field study. *Warnock, V.J., + , T-PWRS May 86* 92–97.

Local area networks
- power system distributed local control system integrated in existing telecontrol network. *Ventosa, J., + , T-PWRD Oct 86* 159–165

Lossless circuits
- rotating-machine stator iron evaluation using resonant circuit. *Timperley, J.E., + , T-EC Sep 86* 94–100

Lyapunov methods, nonlinear systems
- power system transient stability; Lyapunov-like energy criteria for fast stability assessment. *Toumi, B., + , T-PWRS May 86* 211–220.

M

Magnetic ...; cf. Nonlinear magnetics

Magnetic core losses; cf. Eddy currents

Magnetic cores
- deeply saturated soft-iron cores with concentrated winding; magnetic field behavior. *Tay, H.-C., + , T-PWRD Oct 86* 243–249
- forces on conductor segments and magnetized ferrous cores using 3-D finite-element vector-potential method. *Demerdash, N.A., + , T-EC Sep 86* 109–117
- microprocessor-based measuring instrument for rapid testing of transformer core material. *Sankaran, P., + , T-PWRD Oct 86* 19–22

Magnetic cores; cf. Inductors; Power transformers

Magnetic energy storage; cf. Superconducting magnets, energy storage

Magnetic forces
- forces on conductor segments and magnetized ferrous cores using 3-D finite-element vector-potential method. *Demerdash, N.A., + , T-EC Sep 86* 109–117

Magnetic heads; cf. Magnetic recording/reading heads

Magnetic losses
- 3-D flux on tank wall of three-phase transformer; calculation method. *El Nahas, I., + , T-PWRD Jul 86* 156–160.

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Magnetic losses; cf. Eddy currents

Magnetic measurements
- magnetization characteristics measurement using dc excitation for large power transformers and reactors. *Calabrò, S., + , T-PWRD Oct 86* 224–234.
- microprocessor-based measuring instrument for rapid testing of transformer core material. *Sankaran, P., + , T-PWRD Oct 86* 19–22

Magnetic measurements; cf. Magnetooptic measurements

Magnetic recording/reading heads
- 3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157

Magnetization processes; cf. Hysteresis (magnetics)

Magnetohydrodynamics; cf. MHD

Magnetooptic measurements
- gas-insulated cable fault section detection using Faraday-effect optical magnetic field sensor. *Nakamura, E., + , T-PWRD Jan 86* 19–26
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

Magnetostatic analysis
- 3-D magnetostatic field calculation using iterative technique based on magnetic vector potential and Newton – Raphson method. *Mohammed, O.A., + , T-EC Mar 86* 177–185

Magnets; cf. Superconducting magnets, energy storage

Maintenance; cf. Power system maintenance

Man – machine systems; cf. Human factors

Manipulators; cf. Robots

Marketing; cf. Power system economics

Materials handling; cf. Robots

Mathematical programming; cf. Dynamic programming; Integer programming; Linear programming; Nonlinear programming

Matrices; cf. Eigenvalues/eigenvectors; Sparse matrices

Measurement; cf. EHV measurements; Magnetic measurements; Power system measurements

Measurement standards; cf. Calibration

Measurement-system data handling
- digital acquisition and numerical processing of measuring signals at high-voltage circuit breaker testing laboratory. *Hanriot, J.M., + , T-PWRD Jul 86* 134–139

Mechanical factors; cf. Power system mechanical factors; Rotating-machine mechanical factors

Mechanical variables transducers; cf. Position transducers

Meteorology; cf. Power system meteorological factors

MHD
- MHD-EMP effects of power systems; assessment method. *Legro, J.R., + , T-PWRD Jul 86* 203–210

MHD power generation
- integration of MHD plants into electric utility systems. *Jackson, W.D., + , T-EC Sep 86* 26–33

Microcomputer applications; cf. *Specific topic*

Microcomputer languages
- Fortran routines providing interactive capabilities and screen graphics for power engineering education. *Alden, R.T.H., + , T-PWRS May 86* 160–166
- Fortran vs. Pascal for power engineering programming under MS-DOS operating system. *Alden, R.T.H., + , T-PWRS Nov 86* 179–186.

Microcomputer networks; cf. Multiprocessing

Minimization methods; cf. Optimization methods

Mining industry
- high-initial-response brushless excitation system for mine mouth power plant connected to extremely long EHV transmission system. *Stigers, C.A., + , T-EC Mar 86* 2–10.

Modeling; cf. *Specific topic*

Moment methods
- ground-grid analysis algorithm (SGA) based on method of moments; accuracy study. *Joy, E.B., + , T-PWRD Jul 86* 97–103

Monitoring; cf. Power system monitoring

Monte Carlo methods
- EHV system planning including reliability and operational security considerations; Monte Carlo method. *Dodu, J.C., + , T-PWRS Aug 86* 175–181
- probabilistic short-circuit analysis by Monte Carlo simulations and analytical methods. *Balouktsis, A., + , T-PWRS Aug 86* 135–141.
- wind energy contribution to power systems; Monte Carlo simulation method for economic assessment. *Desrochers, G., + , T-EC Dec 86* 50–56

Motor economics
- optimal design to minimize annual cost of three-phase squirrel-cage motor. *Fetih, N.H., + , T-EC Sep 86* 155–160

Motor protection; cf. Synchronous motor protection

Motors
- reliability of motors in power plant applications; results of survey. *Albrecht, P.F., + , T-EC Mar 86* 39–46.

Motors; cf. ac motors; dc motors; Induction motors; Permanent magnet motors; Rotating-machine insulation; Universal motors

Multiarea power systems; cf. Interconnected power systems

Multiconductor transmission lines; cf. Bundle conductors

Multilevel systems; cf. Hierarchical systems

Multiprocessing
- multi-microprocessor traveling-wave relay; design and testing. *Mansour, M.M., + , T-PWRD Oct 86* 74–82.
- multi-microprocessor traveling-wave relay for EHV/UHV transmission protection. *Mansour, M.M., + , T-PWRD Jan 86* 272–279
- multiprocessor-based UHV-line-relay testing with Transient Network Analyzer. *St-Jacques, A., + , T-PWRD Jul 86* 370–375

Multiprocessing; cf. Parallel processing

Multivariable systems
- multivariable control of coal mill for steam turbine-driven generator; control strategy and field test results. *Bollinger, K.E., + , T-PWRS Feb 86* 96–100

N

Natural gas
- capacity planning model used to evaluate natural gas-fired combined cycle systems. *Tabors, R.D., + , T-PWRS May 86* 122–127

Natural gas industry; cf. Pipelines

Network reliability; cf. Graph theory

Newton – Raphson method
- accelerated Newton – Raphson method for finite-element magnetic field analysis of saturated rotating machines. *Nyamusa, T.A., + , T-EC Sep 86* 122–128
- real-time wheeling losses; computation techniques for energy management systems. *Ramanathan, R., T-PWRS Aug 86* 314–320
- 3-D magnetostatic field calculation using iterative technique based on magnetic vector potential and Newton – Raphson method. *Mohammed, O.A., + , T-EC Mar 86* 177–185

Newton's method
- hydrothermal optimal load flow formulation and solution using Newton's method. *El-Hawary, M.E., + , T-PWRS Aug 86* 157–167.

Noise
- static protective relays; noise withstand capability testing. *Jojo, K., T-PWRD Apr 86* 16–23.

Nonhomogeneous media
- resistance of rodbeds and of combined grounding systems in nonuniform soil; analytical expressions. *Nahman, J., + , T-PWRD Jul 86* 90–96

Nonlinear distortion; cf. Harmonic distortion

Nonlinear equations; cf. Newton's method

Nonlinear magnetics
- computer simulation model of steel-core transformer. *Ewart, D.N., T-PWRD Jul 86* 174–183.
- deeply saturated soft-iron cores with concentrated winding; magnetic field behavior. *Tay, H.-C., + , T-PWRD Oct 86* 243–249
- harmonics in power systems due to transformer or shunt reactor saturation. *Dommel, H.W., + , T-PWRD Apr 86* 209–215.
- magnetization characteristics measurement using dc excitation for large power transformers and reactors. *Calabrò, S., + , T-PWRD Oct 86* 224–234.
- power transformer parameter estimation from time-domain data. *Keyhani, A., + , T-PWRD Jul 86* 140–146
- voltage jump at transformer terminals due to nonsimultaneous switching. *Dijk, H.E., T-PWRD Jul 86* 147–155
- 3-D magnetostatic field calculation using iterative technique based on magnetic vector potential and Newton – Raphson method. *Mohammed, O.A., + , T-EC Mar 86* 177–185

Nonlinear magnetics; cf. Rotating-machine nonlinear analysis

Nonlinear programming
- decoupled optimal load flow using linear or quadratic programming. *Contaxis, G.C., + , T-PWRS May 86* 1–7
- power distribution long-term planning model; nonlinear mixed-integer programming problem. *Mikić, O.M., T-PWRS Feb 86* 34–40

Nonlinear systems
- block diagrams for representing nonlinear systems. *IEEE Power Engineering Society, Power System Engineering Ctte., System Dynamic Performance Sctte., + , T-PWRS Aug 86* 95–100
- optimal short-term generation scheduling for large hydrothermal system having transmission limitations; nonlinear network flow formulation of hydro subproblem. *Brännlund, H., + , T-PWRS Nov 86* 75–82.

Nonlinear systems; cf. Adaptive control, nonlinear systems; Decoupling of systems, nonlinear; Observability, nonlinear systems; Optimal control, nonlinear systems; Parameter identification, nonlinear systems; Reduced-order systems, nonlinear; Sensitivity analysis/optimization, nonlinear systems; State estimation, nonlinear systems

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Nonrecursive digital filters; cf. FIR digital filters

Nuclear power generation

- cable installation, cost reduction. *Rebbapragada, R.V., + , T-EC Jun 86* 42–49
- data extraction from computer-aided drafting system in form for input to wiring program. *Lindsay, R.P., + , T-EC Jun 86* 82–87
- financial comparison of large and small plants. *Louh, R.-F., + , T-EC Sep 86* 9–17.

Nuclear power generation auxiliary systems

- testing of large lead stationary batteries in generating plants. *Anderson, J.W., T-EC Sep 86* 76–79.

Nuclear power generation control

- coordinated control system for BWR nuclear plant and HVDC transmission system. *Ishikawa, M., + , T-PWRD Jul 86* 319–325
- microprocessor-based solid-state programmable logic system for control of class 1E components and devices. *Rebbapragada, R.V., + , T-EC Jun 86* 30–35

Nuclear power generation maintenance

- condition monitoring of electrical equipment in nuclear power plants. *Sugarman, A., T-EC Sep 86* 1–8
- reactor trip breakers performance improvement after Feb. 1983 incident at Salem plant. *Stevens, H.H., + , T-EC Jun 86* 5–10
- reactor trip switchgear undervoltage trip failure; US NRC overview. *Wright, R.J., + , T-EC Jun 86* 11–15
- visual inspection programs; computer based barcoded visual inspection program for ASME section XI class 1, 2, & 3 supports. *Wright, W.M., T-EC Dec 86* 9–11

Nuclear power generation mechanical factors

- accelerated aging and seismic testing of class 1E electrical electronic component used in safety-related equipment in mild environment areas of plant. *Jabs, R.H., + , T-EC Jun 86* 27–29
- electromagnetic pulse power coils for repositioning coolant tube spacers in CANDU nuclear reactors. *Dableh, J.H., + , T-EC Dec 86* 1–8

Nuclear power generation protection/safety

- accelerated aging and seismic testing of class 1E electrical electronic component used in safety-related equipment in mild environment areas of plant. *Jabs, R.H., + , T-EC Jun 86* 27–29
- automatic termination of protective action; application of IEEE Std 603–1980. *Heil, P.H., T-EC Jun 86* 23–26
- classification of instrument, control, and electric systems based on importance to safe operation of plant; status of IEEE standards project. *Dowling, E.F., T-EC Jun 86* 1–4
- Emergency Response Information System at Fermi 2 plant. *Basu, S.N., T-EC Jun 86* 16–22
- heat stress effects on power plant workers; sources and management. *Waner, N.S., T-EC Jun 86* 36–41
- microprocessor-based solid-state programmable logic system for control of class 1E components and devices. *Rebbapragada, R.V., + , T-EC Jun 86* 30–35
- nuclear station instrumentation and electrical procedures for reduction of human performance errors; validation. *Heuertz, S.W., + , T-EC Dec 86* 12–17
- reactor trip breakers performance improvement after Feb. 1983 incident at Salem plant. *Stevens, H.H., + , T-EC Jun 86* 5–10
- reactor trip switchgear undervoltage trip failure; US NRC overview. *Wright, R.J., + , T-EC Jun 86* 11–15

Numerical methods; cf. Eigenvalues/eigenvectors; Finite-element methods; Moment methods; Monte Carlo methods; Newton – Raphson method; Newton's method; Optimization methods; Relaxation methods

O

Observability, linear systems

- orthogonal-transformation-based power system state estimation; observability analysis using triangular factorization. *Monticelli, A., + , T-PWRS Feb 86* 201–208.

Observability, nonlinear systems

- topological observability determination in power-system state estimation using network flow method. *Bargiela, A., + , T-PWRS May 86* 108–114.

Observers, linear systems

- observers for tracking of synchronous machine parameters and detection of incipient faults. *Keyhani, A., + , T-EC Jun 86* 184–192.

Occupational health and safety

- heat stress effects on power plant workers; sources and management. *Waner, N.S., T-EC Jun 86* 36–41
- safety against lightning for linemen working on de-energized power lines. *Mousa, A.M., + , T-PWRD Jan 86* 245–250

Occupational health and safety; cf. Electric shock

Oil-filled cables

- reduced-wall 138-kV HPOF cables and joints for re-conductoring of existing 69-kV lines on Florida system. *Prime, J.B., + , T-PWRD Oct 86* 1–8.

Oil-filled transformers

- oil-immersed insulation system in HVDC converter transformers; dc flashover voltage characteristics. *Kurita, A., + , T-PWRD Jul 86* 184–190

Oil-filled transformers; cf. Polychlorinated biphenyls

Oil-impregnated insulation

- oil-immersed insulation system in HVDC converter transformers; dc flashover voltage characteristics. *Kurita, A., + , T-PWRD Jul 86* 184–190

Oil insulation

- power transformers and shunt reactors for arctic regions; performance and operation guidelines. *Lampe, W., T-PWRD Jan 86* 217–224
- ZnO surge arresters; ac voltage aging of ZnO ceramics in air, SF_6, and transformer oil. *Vicaud, A., T-PWRD Apr 86* 49–58.

Optical fiber measurement applications

- gas-insulated cable fault section detection using Faraday-effect optical magnetic field sensor. *Nakamura, E., + , T-PWRD Jan 86* 19–26

Optical fiber telemetry

- high-speed current differential protection scheme using fiber-optic link for 3-terminal transmission lines. *Aggarwal, R.K., + , T-PWRD Jan 86* 125–134.

Optical measurements; cf. Magnetooptic measurements; Optical fiber measurement applications

Optical transducers; cf. Electrooptic transducers; Magnetooptic measurements

Optimal control; cf. Adaptive control; Fuel-optimal control

Optimal control, linear systems

- coordinated governor/exciter stabilizer design in multimachine power systems. *Wilson, W.J., + , T-EC Sep 86* 61–67
- online generator state estimation and optimal control to improve stability; laboratory results. *Vaahedi, E., + , T-EC Sep 86* 55–60
- power generation control; digital multivariable optimal control system. *Ohtsuka, K., + , T-EC Jun 86* 88–98.

Optimal control, nonlinear systems

- integrated ac/dc system dynamic performance improvement using optimal modulation control; evaluation using eigenvalue sensitivity analysis. *Choudhry, M.A., + , T-PWRS May 86* 128–137.

Optimization methods

- optimal design to minimize annual cost of three-phase squirrel-cage motor. *Fetih, N.H., + , T-EC Sep 86* 155–160
- reactive power planning of subtransmission network under normal operation; optimization method. *Lee, K.Y., + , T-PWRS May 86* 153–159

Optimization methods; cf. Dynamic programming; Gradient methods; Integer programming; Linear programming; Load flow analysis; Nonlinear programming; Power generation dispatch

P

Parallel processing

- parallel algorithm for sparse-matrix inversion. *Betancourt, R., + , T-PWRS Feb 86* 74–81

Parallel processing; cf. Multiprocessing

Parameter estimation

- power transformer parameter estimation from time-domain data. *Keyhani, A., + , T-PWRD Jul 86* 140–146

Parameter estimation; cf. Adaptive control; Power system parameter estimation

Parameter identification; cf. Power system identification

Parameter identification, linear systems

- power system thermal units' input/output curves; online identification. *Chen, H.Y.K., + , T-PWRS May 86* 221–224

Parameter identification, nonlinear systems

- synchronous machine transient and subtransient parameters identification using quasilinearization-based algorithm. *Jaleeli, N., + , T-PWRS Aug 86* 46–52

Partial discharges; cf. Corona

Pattern recognition

- power system online transient security assessment and economic load dispatch. *Yamashiro, S., T-PWRS Aug 86* 214–219

Pattern recognition; cf. Image pattern recognition

PCB insulation; cf. Polychlorinated biphenyls

Permanent magnet motors

- accelerated Newton – Raphson method for finite-element magnetic field analysis of saturated rotating machines. *Nyamusa, T.A., + , T-EC Sep 86* 122–128
- asynchronous performance prediction for ac PM motors. *Ishizaki, A., + , T-EC Sep 86* 101–108

Petroleum industry; cf. Pipelines

Phase distortion; cf. Delay effects

Phase measurement

- power system high-rate digital telemetry for systems with large distances between stations. *Dalpiaz, C.P., + , T-PWRS Aug 86* 202–206

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Phase shifters
- damping subsynchronous oscillations using thyristor-controlled phase shifter. *Iravani, M.R., + , T-PWRS May 86* 76–83.
- suppressing transient shaft stresses of turbine-generators using static phase-shifter. *Iravani, M.R., + , T-EC Mar 86* 186–192

Phase transformers
- phase-shifting transformers for 500-kV Daniel – McKnight interconnection. *Patel, B.K., + , T-PWRD Jul 86* 167–173.

Photovoltaic power systems
- dc motors powered by photovoltaic power; starting and steady-state characteristics for constant load and ventilator load. *Appelbaum, J., T-EC Mar 86* 17–25.
- harmonic characteristics and impact on utility distribution system of residential systems interactive with utility. *Ranade, S.J., T-PWRD Apr 86* 121–128.
- Hawaii photovoltaic R&D program. *Neill, D.R., + , T-EC Dec 86* 43–49
- integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24
- performance prediction based on long-term climatological data and expected cell performance; probabilistic approach. *Khallat, M.A., + , T-EC Sep 86* 34–40
- power conditioning for photovoltaic central-station power plants; state-of-the-art and advanced technology. *Bulawka, A., + , T-EC Mar 86* 47–53
- residential photovoltaic power systems; impact on distribution feeder. *Fitzer, J., + , T-EC Dec 86* 39–42
- solar photovoltaic and thermal collectors. *Braunstein, A., + , T-EC Dec 86* 31–33
- utility-scale plants (100 – 200 MW); recent projects and design studies. *Leonard, S.L., T-EC Jun 86* 61–67.

PID (proportional-integral-derivative) control; cf. Proportional control

Pipe cables
- direct-buried pipe-type cable splices; thermal performance. *Prime, J.B., Jr., + , T-PWRD Apr 86* 1–6.

Pipe cables; cf. Gas-filled cables; Oil-filled cables

Pipeline processing; cf. Array processing

Pipelines
- common-corridor sharing by overhead power line, railroad, and pipeline; induced voltages and currents. *Frazier, M., + , T-PWRD Jul 86* 294–300
- natural-gas pipeline in vicinity of HV substations and transmission structures; induction and earth-conduction effects due to phase-to-ground faults. *Dawalibi, F., + , T-PWRD Apr 86* 40–48.

Planning; cf. Business planning; Power system planning

Plastic-insulated cables; cf. Polyethylene-insulated cables

Pockels effect
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

Poles and zeros; cf. Eigenvalues/eigenvectors

Polychlorinated biphenyls
- fire involving PCB-filled transformer in underground vault adjacent to high-rise office building; decontamination of building. *Maslowski, R., + , T-PWRD Jan 86* 239–244

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- condition monitoring of electrical equipment in nuclear power plants. *Sugarman, A., T-EC Sep 86* 1–8
- expert system for handling energy management system alarms. *Wollenberg, B., T-PWRS May 86* 241–247.
- full-scale control system for supervision and control of realistic power system model. *Hagengren, B., + , T-PWRS Aug 86* 292–297
- HIS, real-time historical information spreadsheet for power system operation. *Zunser, B.E., + , T-PWRS Nov 86* 238–242

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- advances in energy management systems; summary of discussion at 1985 PICA Conference. *Horton, J.S., + , T-PWRS Aug 86* 226–234
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- operator training problems. *IEEE Power Engineering Society, Power System Engineering Ctte., Working Group on Operator Training, + , T-PWRS Aug 86* 53–59

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Power system parameter estimation; cf. Power system identification

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- integrating demand-side management into utility planning. *IEEE Power Engineering Society, Power System Engineering Ctte., Demand-Side Management Sctte., + , T-PWRS Aug 86* 81–87
- intelligent load flow engine for power system planning. *Fujiwara, R., + , T-PWRS Aug 86* 302–307
- maximal steady-state security regions; application to power system planning and operation. *Liu, C.-C., T-PWRS Nov 86* 19–27.
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Power system planning; cf. Power distribution planning; Power generation planning; Power transmission planning

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- expert systems for fault diagnosis and protection. *Talukdar, S.N., + , T-PWRS Aug 86* 182–187
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Power system relaying

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Power system reliability; cf. Power distribution reliability; Power generation reliability; Power system security; Power transmission reliability

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Power system steady-state stability; cf. Power system stability, dynamic

Power system telemetry; cf. Power system communication

Power system transient stability; cf. Power system stability, transient

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- corona modeling for calculation of transients on transmission lines. *Semlyen, A., + , T-PWRD Jul 86* 228–239.
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- gas-insulated substation equipment impulse voltage measurment using single-capacitor differentiating – integrating system. *Shihab, S., T-PWRD Jul 86* 42–47.
- interactive electromagnetic transient analysis program for electrical engineering education. *Schroder, F., + , T-PWRS Nov 86* 211–214
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- MHD-EMP effects of power systems; assessment method. *Legro, J.R., + , T-PWRD Jul 86* 203–210
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- static protective relays; noise withstand capability testing. *Jojo, K., T-PWRD Apr 86* 16–23.
- time-delay compensation for high-speed digital protection of power systems. *Kumar, B.S.A., T-PWRD Oct 86* 68–73.
- ZnO sheath voltage limiter for HV and EHV power cable; field experience and laboratory tests. *Parmigiani, B., + , T-PWRD Jan 86* 164–170

Power system transients; cf. Lightning, power systems; Power system stability; Power transmission protection; Rotating-machine transient analysis; Switching transients; Synchronous generator transient analysis

Power systems

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Power systems; cf. *Specific topic*

Power transformer insulation; cf. Power distribution transformer insulation

Power transformer insulation testing

- recommended dielectric tests and test procedures for HVDC converter transformers and smoothing reactors. *IEEE Power Engineering Society, Working Group on Dielectric Tests for HVDC Stressed Transformers and Reactors, + , T-PWRD Jul 86* 161–166.

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- fault-withstand-time reduction for power transformers; planning and protection implications. *Brown, R.W., + , T-PWRD Oct 86* 60–67.
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- magnetization characteristics measurement using dc excitation for large power transformers and reactors. *Calabrò, S., + , T-PWRD Oct 86* 224–234.
- optimal production design procedure; effect of varying parameters for lowest cost. *Poloujadoff, M., + , T-PWRS Nov 86* 202–206.
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Power transformers; cf. EHV transformers

Power transmission

- six-phase transmission system as alternative with greater stability than three-phase double-circuit lines. *Chandrasekaran, A., + , T-PWRS Feb 86* 108–112.
- transmission-constrained and generation-constrained economic dispatch; probabilistic simulation of system behavior based on continuation method. *Reinstein, D., + , T-PWRS May 86* 248–256.
- weak transmission boundaries resulting in transient stability problems; determining and ranking weak boundaries and vulnerable network elements. *Lotfalian, M., + , T-PWRS May 86* 84–91

Power transmission; cf. EHV transmission; HVDC transmission; Interconnected power systems; Load flow analysis; UHV transmission

Power transmission control

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- corrective control of power system flows by line and bus-bar switching. *Mazi, A.A., + , T-PWRS Aug 86* 258–265.
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Power transmission control; cf. HVDC transmission control; Reactive power control

Power transmission economics

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- real-time optimal voltage/VAR control of Ontario Hydro EHV system to reduce active transmission losses. *El-Kady, M.A., + , T-PWRS May 86* 98–107.
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- series-capacitor compensation of long lines evaluated from technical and economic standpoints. *Saied, M.M., T-PWRD Apr 86* 248–253.
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Power transmission lines; cf. Capacitor-compensated transmission lines; EHV transmission lines; Inductor-compensated transmission lines; Power cables; Power transmission ...; Superconducting transmission lines

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Power transmission meteorological factors; cf. Lightning, power systems Power transmission mechanical factors

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Power transmission protection; cf. Grounding; Lightning, power systems Power transformer protection; Power transmission faults Protective relaying

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Power transmission structures; cf. Power transmission mechanical factors

Power transmission testing
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Power transmission testing; cf. Circuit-breaker testing; Power transmissio faults; Switchgear testing

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Process heating; cf. Arc heating; Cogeneration

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- power system stabilizer using proportional – integral control. *Hsu, Y.-Y., + , T-PWRS May 86* 46–53.

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- dc bias effect on sensitive ground-fault interrupter performance. *Emanuel, A.E., + , T-PWRD Jan 86* 111–117
- determining level-of-protection for small power producer/utility interconnection; decision analysis model. *Bowe, T.R., + , T-PWRD Jul 86* 78–89.
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- field experience with AEP digital relay. *Adamiak, M.G., + , T-PWRD Oct 86* 91–98.
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Radio noise/interference; cf. Electromagnetic interference, radiated

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- contingency analysis using distribution factors; reactive power redistribution following outage. *Ilic-Spong, M., + , T-PWRS Aug 86* 266–275.
- distribution feeders; computer-controlled adaptive compensator. *Keene, G., + , T-PWRD Jul 86* 337–345
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Refuse; cf. Waste materials

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- rotating-machine stator iron evaluation using resonant circuit. *Timperley, J.E., + , T-EC Sep 86* 94–100

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RF interference; cf. Electromagnetic interference, radiated

Risk assessment/management

- large ac motor winding-insulation breakdown due to steep switching surges; calculation of surge magnitude for risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 130–139.
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- RF-interference-induced arcing of turbogenerator stator windings. *Emery, F.T., + , T-EC Jun 86* 172–179.

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Rotating-machine mechanical factors

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- saturated squirrel-cage induction machine transients and steady-state performance analysis using equivalent magnetic circuit. *Ostović, V., T-EC Sep 86* 190–197.
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- synchronous machines; two alternate saturation representations. *de Mello, F.P., + , T-PWRS Nov 86* 8–18.
- 3-D electromagnetic analysis of electrical machinery and devices; theory. *Chari, M.V.K., + , T-EC Jun 86* 145–150
- 3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157

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Rotating-machine stability; cf. Power system stability; Synchronous generator stability

Rotating-machine testing

- stator iron evaluation using resonant circuits. *Timperley, J.E., + , T-EC Sep 86* 94–100

Rotating-machine testing; cf. Rotating-machine insulation testing

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- determining power generation dispatch curves for non-monotonically increasing heat rate curves using dynamic programming. *Shoults, R.R., + , T-PWRS Feb 86* 10–16
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- transient voltage propagation in winding of large ac motor; results of impulse tests. *Gupta, B.K., + , T-EC Mar 86* 122–129. †

Rotating-machine transient analysis; cf. Synchronous generator transient analysis

Rotating machines

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Rotating machines; cf. ac machines; ac motors; Brushless rotating machines; Induction generators; Induction motors; Motors; Superconducting rotating machines; Synchronous generators

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- integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24

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Safety; cf. Protection/safety

Sampled-data filters; cf. Digital filters

Satellite telemetry

- power system high-rate digital telemetry for systems with large distances between stations. *Dalpiaz, C.P., + , T-PWRS Aug 86* 202–206

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- EHV gas-insulated substation in area of seismic activity; engineering design and construction. *Sabath, J., + , T-PWRD Oct 86* 152–158
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- nuclear power plant class 1E electrical/electronic components in mild environmental areas of plant; accelerated aging and seismic testing. *Jabs, R.H., + , T-EC Jun 86* 27–29

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Sensitivity analysis/optimization, linear systems

- reactive power dispatch based on sparse sensitivity matrix and linear programming. *Mota-Palomino, R., + , T-PWRS Aug 86* 31–39

Sensitivity analysis/optimization, nonlinear systems

- integrated ac/dc system dynamic performance improvement using optimal modulation control; evaluation using eigenvalue sensistivity analysis. *Choudhry, M.A., + , T-PWRS May 86* 128–137.

Series-compensated transmission lines; cf. Capacitor-compensated transmission lines

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Shunt compensation; cf. Capacitor-compensated transmission lines; Inductor-compensated transmission lines

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Single-pole switching

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Stress analysis; cf. Mechanical factors

Structural engineering; cf. Power transmission mechanical factors

Submarine ...; cf. Underwater ...

Substation insulation; cf. Gas-insulated substations

Substation measurements

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Substations; cf. EHV substations; Gas-insulated substations

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Superconducting magnets, energy storage

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Surges; cf. Transient analysis

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Switches/switching; cf. Air break switches; Capacitor switching; Disconnecting switches; Gas switches; Vacuum switches

Switchgear; cf. Circuit breakers; Vacuum interrupters

Switchgear testing

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Switchgear testing; cf. Circuit-breaker testing

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Switching transients

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- excessive current surges in varistors and fuses protecting thyristor motor drives at remote substation, due to switching of capacitors. *Martzloff, F.D., T-PWRD Apr 86* 59–66.
- impulse testing of metal-oxide surge arresters; alternative to LDCIW (long duration current impule withstand test). *Bargigia, A., + , T-PWRD Oct 86* 173–183.
- large ac motor winding-insulation breakdown due to steep switching surges; calculation of surge magnitude for risk assessment. *Bacvarov, D.C., + , T-EC Mar 86* 130–139.
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- qualification of switchable metal-oxide arresters for protective level of 1.6 p.u. on Hydro-Quebec's 735-kV system. *Latour, Y., + , T-PWRD Oct 86* 184–193.
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- suppression of fast transient overvoltage during gas disconnector switching in gas-insulated substation. *Ozawa, J., + , T-PWRD Oct 86* 194–201.
- switching concerns associated with 345-kV shunt capacitor applications; results of New York Power Authority study. *Mikhail, S.S., + , T-PWRD Apr 86* 221–230.
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Synchronous generator stability
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Synchronous generator stability; cf. Power system stability

Synchronous generator transient analysis
- identifying transient and subtransient parameters using quasilinearization-based algorithm. *Jaleeli, N., + , T-PWRS Aug 86* 46–52
- observers for tracking of synchronous machine parameters and detection of incipient faults. *Keyhani, A., + , T-EC Jun 86* 184–192.
- suppressing transient shaft stresses of turbine-generators using static phase-shifter. *Iravani, M.R., + , T-EC Mar 86* 186–192
- turbogenerator shaft response torque and stressing; dependence on damper modeling and fault clearing process. *Hammons, T.J., + , T-EC Mar 86* 113–121.

Synchronous generators
- dispersed storage and generation; overvoltages on isolated feeders connected to synchronous or induction generators due to ferroresonance. *Feero, W.E., + , T-PWRD Jan 86* 258–264
- distribution system generation; constants for isolation studies on small induction generators and synchronous generators. *Gish, W.B., T-PWRD Apr 86* 231–239.
- large-signal response modeling; applicability of small-signal test data. *Minnich, S.H., T-EC Mar 86* 94–102.
- optimal thermal design of superconducting generator rotor. *Sato, K., + , T-EC Sep 86* 217–224
- real-time model implemented on microprocessor. *Macminn, S.R., + , T-PWRS Aug 86* 220–225
- superconducting ac generators; design of large-capacity 1000-MVA commercial generators. *Kumagai, M., + , T-EC Dec 86* 122–129
- superconducting generator at 300 MVA; axisymmetric finite-element model for nonaxisymmetric electromechanical loads. *Ahmed, M.E., + , T-EC Sep 86* 148–154
- superconducting generator at 300-MVA; thermal stress analysis and stator design using finite elements. *Nathenson, R.D., + , T-EC Sep 86* 141–147
- synchronous generator modeling for power system stability simulations. *IEEE Power Engineering Soc., Power Syst. Engineering & Rotating Machinery Cttes., Joint Working Group on Determination and Application of Synchronous Machine Models for Stability Studies, + , T-EC Mar 86* 77–93.
- 3-D electromagnetic analysis of electrical machinery and devices; application to generators, inductor, and recording head. *Chari, M.V.K., + , T-EC Jun 86* 151–157

Synchronous generators; cf. Hydroelectric generators; Power generation Turbogenerators

Synchronous machines
- decoupled reduced-order linear state-space model; application t synchronous machines. *Diao, Y.-, + , T-EC Sep 86* 211–216
- nonlinear model of synchronous machines with saliency. *Xie, G., + , T-EC Sep 86* 198–204.
- two alternate saturation representations. *de Mello, F.P., + , T-PWRS Nov 86* 8–18.

Synchronous motor drives; cf. Linear synchronous motors

Synchronous motor protection
- insulation degradation due to switching surges; surge protection requirements. *Nassar, O.M., T-EC Sep 86* 182–189.

Synchronous motors; cf. Hysteresis motors; Linear synchronous motors; Permanent magnet motors; Reluctance motors

System identification; cf. Parameter identification; Power system identification

T

Technician training; cf. Training

Telemetry; cf. Measurement-system data handling; Optical fiber telemetry; Power system communication; Satellite telemetry

Temperature control; cf. Thermal factors

Terrain mapping; cf. Geographic information systems

Testing; cf. Accelerated testing; Insulation testing; Life estimation; Power system testing; Rotating-machine testing

Thermal energy storage
- marketing customer thermal energy storage to reduce peak demand. *Bentley, W.G., + , T-PWRS Nov 86* 57–61

Thermal factors; cf. Biological thermal factors; Insulation thermal factors; Power cable thermal factors; Power transformer thermal factors; Rotating-machine thermal factors

Thermal power generation
- capacity planning model used to evaluate natural gas-fired combined cycle systems. *Tabors, R.D., + , T-PWRS May 86* 122–127
- fast valving of steam turbines to aid system stability; panel discussion. *Edwards, L.,* Chmn., *+ , T-PWRS Feb 86* 143–153
- fuel contracting under uncertainty in power industry. *Fancher, R.B., + , T-PWRS Feb 86* 26–33.
- multivariable control of coal mill for steam turbine-driven generator; control strategy and field test results. *Bollinger, K.E., + , T-PWRS Feb 86* 96–100
- online parameter identification of input/output curves of thermal units. *Chen, H.Y.K., + , T-PWRS May 86* 221–224

Thermal power generation; cf. Cogeneration; Hydroelectric – thermal power generation; MHD power generation; Nuclear power generation; Power generation

Thermal power generation, air pollution
- combustion diagnosis method for pulverized coal boilers using flame-image recognition technology. *Kurihara, N., + , T-EC Jun 86* 99–103
- combustion diagnosis method for pulverized coal boilers using flame-image recognition technology. *Kurihara, N., + , T-EC Jun 86* 99–103
- power pooling's impact on production costs and emissions; analysis using economic dispatch models. *Brodsky, S.F.J., + , T-PWRS Feb 86* 57–62

Thyristor converters
- superconducting magnet energy storage; simultaneous active and reactive power control using gate-turnoff thyristor converter. *Ise, T., + , T-PWRD Jan 86* 143–150

Thyristor motor drives
- excessive current surges in varistors and fuses protecting thyristor motor drives at remote substation, due to switching of capacitors. *Martzloff, F.D., T-PWRD Apr 86* 59–66.

Thyristors
- turbine-generator field insulation; evaluation for high-voltage thyristor excitation. *Nigano, S., + , T-EC Dec 86* 115–121

Time domain analysis; cf. Transient analysis

Topology; cf. Circuit topology; Graph theory

Towers; cf. Power transmission mechanical factors

Traction motors; cf. Rail-transportation propulsion

Training
- power generation dispatcher training simulator; development, training course, and results. *Susumago, I., + , T-PWRS May 86* 67–75.
- power system operator training problems. *IEEE Power Engineering Society, Power System Engineering Ctte., Working Group on Operator Training, + , T-PWRS Aug 86* 53–59

Transfer functions
- block diagrams for representing nonlinear systems. *IEEE Power Engineering Society, Power System Engineering Ctte., System Dynamic Performance Sctte., + , T-PWRS Aug 86* 95–100

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- power system small-signal stability analysis using eigenvalue and frequency response methods. *Martins, N., T-PWRS Feb 86* 217–226.

Transformer oil; cf. Oil insulation

Transformers
- aging of electrical appliances due to power system harmonics; transformers, universal motors, and induction motors. *Fuchs, E.F., + , T-PWRD Jul 86* 301–307
- microprocessor-based measuring instrument for rapid testing of transformer core material. *Sankaran, P., + , T-PWRD Oct 86* 19–22

Transformers; cf. Differential transformers; Phase transformers; Power transformers; Voltage transformers

Transforms; cf. Discrete Fourier transforms; Laplace transforms

Transient analysis; cf. Power system transients; Rotating-machine transient analysis; Switching transients

Transient stability; cf. Power system stability, transient

Transmission lines; cf. Distributed-parameter circuits; Power transmission lines

Transmission of electric power; cf. Power transmission

Traveling-wave devices
- multi-microprocessor traveling-wave relay; design and testing. *Mansour, M.M., + , T-PWRD Oct 86* 74–82.
- multi-microprocessor traveling-wave relay for EHV/UHV transmission protection. *Mansour, M.M., + , T-PWRD Jan 86* 272–279

Trees (insulation); cf. Plastic insulation

Turbines
- fast valving of steam turbines to aid system stability; panel discussion. *Edwards, L., Chmn., + , T-PWRS Feb 86* 143–153

Turbines; cf. Hydraulic turbines; Power generation control, governor; Turbogenerators

Turbogenerator mechanical factors
- hydroelectric generator stator frame distortion problem in large diameter generators. *Sawatani, K., + , T-EC Mar 86* 33–38.
- hysteretic damping of turbogenerator shaft torsional oscillators. *Smith, J.R., + , T-EC Mar 86* 152–160.
- suppressing transient shaft stresses of turbine-generators using static phase-shifter. *Iravani, M.R., + , T-EC Mar 86* 186–192
- torsional-fatigue-crack initiation in large turbogenerator shafts; prediction method. *Williams, R.A., + , T-EC Sep 86* 80–86.
- torsional interactions in synchronous generators due to subsynchronous resonance; suppression using passive shunt device. *Ooi, B.-T., + , T-EC Mar 86* 161–168.
- torsional modal frequencies of 900 MW turbogenerator; measurement. *Bigret, R., + , T-EC Dec 86* 99–107.
- transient analysis; effect of damper modeling and fault clearing process on shaft response torque and stressing. *Hammons, T.J., + , T-EC Mar 86* 113–121.
- turbine-generator torsional model; method for identifying parameters from measured data. *Chow, J.H., + , T-EC Dec 86* 83–90.

Turbogenerators
- eddy currents induced in inner stator frame of large turbogenerators by end-zone field. *Bratoljic, T., T-EC Dec 86* 108–114
- online diagnosis of turbogenerator using expert system. *Gonzalez, A.J., + , T-EC Jun 86* 68–74
- partial discharge and noise-pulse propagation in turbogenerator stator winding insulation; application to maintenance testing. *Henriksen, M., + , T-EC Sep 86* 161–166.
- RF-interference-induced arcing of turbogenerator stator windings. *Emery, F.T., + , T-EC Jun 86* 172–179.
- synchronous generator feeding HVDC link for medium-sized and large-sized power plants. *Ammann, C., + , T-EC Jun 86* 75–81
- turbine-generator field insulation; evaluation for high-voltage thyristor excitation. *Nigano, S., + , T-EC Dec 86* 115–121

Turbogenerators; cf. Hydroelectric generators; Wind power generation

U

UHF measurements
- 900-MHz EMI measurements on 230-kV and 500-kV power lines. *Chartier, V.L., + , T-PWRD Apr 86* 140–149.

UHV transmission
- multi-microprocessor traveling-wave relay for EHV/UHV transmission protection. *Mansour, M.M., + , T-PWRD Jan 86* 272–279
- multiprocessor-based UHV-line-relay testing with Transient Network Analyzer. *St-Jacques, A., + , T-PWRD Jul 86* 370–375

Underground antennas; cf. Buried antennas

Underground power cables; cf. Power cables; Power transmission lines, underground

Underwater power cables
- cable selection methodology for deep-water power transmission system applications. *Walldorf, S.P., + , T-PWRD Jan 86* 34–40.
- HVDC system consisting of underwater cable connecting two overhead lines; detecting faults in underwater cable. *Kato, Y., + , T-PWRD Jul 86* 332–336
- underwater HVDC link connecting Britain and France; steady-state stresses in SF_6-filled transition joining sea and land cables. *Weedy, B.M., + , T-PWRD Jul 86* 1–6
- underwater HVDC link connecting Britain and France; transient stresses in SF_6-filled transition joining sea and land cables. *Weedy, B.M., + , T-PWRD Jul 86* 7–12

Uninterruptible power systems
- sizing of storage batteries for generating stations. *Migliaro, M.W., T-EC Dec 86* 25–30

United Kingdom
- high-voltage engineering in United Kingdom universities; teaching and research. *Weedy, B.M., T-PWRS Nov 86* 165–170.

Universal motors
- aging of electrical appliances due to power system harmonics; transformers, universal motors, and induction motors. *Fuchs, E.F., + , T-PWRD Jul 86* 301–307

Universal product codes; cf. Bar code reading

Urban areas
- isolated mid-city power system protection; microprocessor-based stabilizing control. *Ohura, Y., + , T-PWRD Oct 86* 99–104

V

Vacuum interrupters
- axial magnetic-field type vacuum interrupters; ten years' experience. *Yanabu, S., + , T-PWRD Oct 86* 202–208
- post-arc current phenomena. *Yanabu, S., + , T-PWRD Oct 86* 209–214

Vacuum switches
- synthetic test circuit for circuit breakers; reignition circuit using triggered vacuum gaps in series as fast switches. *Vries, L.M.J., + , T-PWRD Apr 86* 75–80.

VAR (volt-ampere) reactive; cf. Reactive power

Varistors
- EHV series-capacitor reinsertion; SiC and ZnO varistors compared. *Achilles, R.A., + , T-PWRS Aug 86* 127–134.
- excessive current surges in varistors and fuses protecting thyristor motor drives at remote substation, due to switching of capacitors. *Martzloff, F.D., T-PWRD Apr 86* 59–66.

Ventilation
- dc motors powered by photovoltaic power; starting and steady-state characteristics for constant load and ventilator load. *Appelbaum, J., T-EC Mar 86* 17–25.
- ventilation simulation for hydroturbine generator – motor. *Fukushima, M., + , T-EC Sep 86* 174–181

Vibrations; cf. Mechanical factors

Voltage control; cf. Power capacitors; Power generation control; Power system stability; Power transmission control

Voltage dividers
- high-voltage power measurements at very low power factors using current comparator. *So, E., T-PWRD Jan 86* 98–104

Voltage measurement
- power system current measurement using Faraday-effect magnetooptic device and voltage measurement with Pockels-effect electrooptic device. *Kanoi, M., + , T-PWRD Jan 86* 91–97

Voltage transformers
- switching of disconnectors in gas-insulated switchgear with voltage transformer in circuit; preventing overvoltages. *Lalot, J., + , T-PWRD Jan 86* 203–211

W

Waste materials
- integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24

Weather; cf. Power system meteorological factors

Weibull distributions
- asymptotics of moments of order statistics and failure occurrence sequences. *Kogan, V.I., T-EC Mar 86* 61–67

Wind; cf. Power transmission mechanical factors; Power transmission meteorological factors

Wind energy
- integrated renewable energy systems for rural areas of developing countries; linear programming approach to design. *Ramakumar, R., + , T-EC Dec 86* 18–24

Wind power generation
- extreme wind calculation comparing two statistical distributions; converting annual extremes to daily or monthly extremes. *Henry, D.H., + , T-EC Jun 86* 125–130

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predicting power variations one or more hours ahead using circle of meteorological towers at radius of 100 miles. *Schlueter, R.A., + , T-PWRS Feb 86* 137–142

self-excited induction generators; steady-state analysis. *Yegna Narayanan, S.S., + , T-EC Mar 86* 169–176.

steady-state performance of variable-speed constant-frequency double-output wind-powered induction generator. *Salameh, Z.M., + , T-EC Mar 86* 26–32.

torque ripple propagation and elimination. *Dessaint, L., + , T-EC Jun 86* 104–112

wind energy contribution to power systems; Monte Carlo simulation method for economic assessment. *Desrochers, G., + , T-EC Dec 86* 50–56

Wire communication; cf. Power distribution communication

Wire telemetry; cf. Optical fiber telemetry; Power distribution communication; Power system communication

Wiring

data extraction from computer-aided drafting system in form for input to wiring program. *Lindsay, R.P., + , T-EC Jun 86* 82–87

Workstations, human factors

intelligent load flow engine for power system planning. *Fujiwara, R., + , T-PWRS Aug 86* 302–307

X

XLPE (cross-linked polyethylene) insulation; cf. Polyethylene-insulated cables, cross-linked

Z

Zinc materials/devices

distribution surge arrester behavior due to lightning-induced voltages. *Yokoyama, S., T-PWRD Jan 86* 171–178

gapless ZnO surge arrester life estimation. *Carlson, W.G., + , T-PWRD Apr 86* 67–74.

metal oxide surge arresters having pressure relief design. *Ozawa, J., + , T-PWRD Jan 86* 151–156

metal oxide surge arresters; response to steep-front current impulses as compared to conventional SiC arresters. *Dang, C., + , T-PWRD Jan 86* 157–163

ZnO sheath voltage limiter for HV and EHV power cable; field experience and laboratory tests. *Parmigiani, B., + , T-PWRD Jan 86* 164–170

ZnO surge arrester performance, remote monitoring; special surge analyzer. *Nichols, D.K., + , T-PWRD Jul 86* 191–196

ZnO surge arresters; ac voltage aging of ZnO ceramics in air, SF_6, and transformer oil. *Vicaud, A., T-PWRD Apr 86* 49–58.

Zinc materials/devices; cf. Varistors